

## Pesticides in Forestry

Issue: In 1998, 2004, and 2013, EPA and NOAA determined that Oregon's had deficiencies in their forestry management measure for adequate spray buffers for aerial application of herbicides on Type N streams. Given information and clarification received in the public comment period, §

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**Original 1998 Condition:** Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degradation of beneficial uses attributable to forestry exist despite implementation of the (g) measures.

### ***Excerpts from 1998 Rationale for the Additional Management Measures for Forestry Condition:***

“Within two years, Oregon will identify and begin applying additional management measures for forestry. As discussed in section III, above, Oregon's program includes management measures for forestry in conformity with the (g) guidance. Best available information, however, indicates existing water quality impairments attributable to forestry in certain areas, and that the existing FPRs are inadequate to restore water quality and fully support designated beneficial uses....

NOAA and EPA have identified areas where existing practices under the FPA and FPR should be strengthened to attain water quality and standards and fully support beneficial uses ... [including] ... the adequacy of stream buffers for application of certain chemicals. More specifically, the rationale states that Oregon's program “did not require buffers for aerial application of herbicides or fertilizers for type N (non-fish bearing) streams” on forestlands. The rationale states that in the coastal nonpoint management area, non-fish bearing streams comprise 60-70% of the total stream length, and while new rules require a 60-foot buffer on Type N streams for aerial application of non-biological insecticides and fungicides, “the rules do not restrict herbicides, which would appear to leave type N streams still at risk.”

### ***Basic CZARA Management Measure Forestry Chemical Management***

Note: NOAA and EPA found Oregon had satisfied this measure, along with all of the other standard forestry management measures in the 1998 conditional approval findings. Instead, we noted Oregon needed additional management measures where water quality impairments and the degradation of beneficial uses were impaired due to forestry activities. It has been NOAA and EPA policy not to revisit any management measure approvals that were made during the 1998 findings.

Use chemicals when necessary for forestry management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application:

- (1) Conduct applications by skilled and, where required, licensed applicators according to the registered use, with special consideration given to impacts to nearby surface waters.
- (2) Carefully prescribe the type and amount of pesticides appropriate for the insect, fungus, or herbaceous species.
- (3) Prior to applications of pesticides and fertilizers, inspect the mixing and loading process and the calibration of equipment, and identify the appropriate weather conditions, the spray area, and buffer areas, for surface waters.

- (4) Establish and identify buffer areas for surface waters. (This is especially important for aerial applications).
- (5) Immediately report accidental spills of pesticides or fertilizers into surface waters to the appropriate state agency. Develop an effective spill contingency plan to contain spills.

#### Background:

##### *Additional Management Measures for Forestry*

EPA and NOAA's decision to place additional management measures for forestry arose from NMFS' proposal to list coastal coho as threatened under ESA in July 1995. The State initiated a Coastal Salmon Restoration Initiative (CSRI) often called "The Oregon Plan" in October 1995. This was a multi-agency statewide effort to evaluate the health of salmon, forestry practices and other processes harming salmon in Oregon coastal regions. The Plan described proposed and voluntary conservation measures in Oregon's programs as an alternative to NMFS listing coastal coho salmon under ESA. The CSRI was completed in March 1997, and in May 1997, NMFS withdrew its proposal to list coastal coho based on the Oregon Plan. NRDC challenged this decision, and in June 1998, the U.S. District Court overturned NMFS' decision stating that NMFS could not rely on proposed and voluntary conservation measures as a basis for not listing species. In August 1998, NMFS listed coastal coho as threatened under ESA.

The 1997 Oregon Plan comprised the work of scientists in state agencies and academic institutions over two years to evaluate the effects of forestry and other practices on salmon. It identified causes of degradation to salmon habitat and salmon health from forestry practices and recommended actions by ODF and other agencies for improvement. Forestry dominates the land use in Oregon's coastal areas, so many of the recommendations in the Oregon Plan relate to ODF and improvements to forestry practices.

##### *Basis for Needing Spray Buffers for Aerial application of herbicides on Type N Streams*

While harmful impacts to salmon from roads, landslides, and lack of riparian protections are mentioned in many reports and early on in the CSRI process, a September 10, 1996 NMFS memo refers for the first time to "Forest Chemical Applications" in proposed rules by ODF in the CSRI, to change the current chemical application rules for forestry for aerial application of fungicides and non-biological insecticides to 300 feet on Type F and Type D streams and to 60 feet on Type N streams. ODF does not propose buffers for aerial application of herbicides.

Subsequent communications between EPA, NOAA and the State begin to refer to the lack of spray buffers for aerial application of herbicides on Type N streams. NMFS developed a White Paper on July 2, 1996 with recommendations for ODF to address in the CSRI that "A pesticide management proposal should address concerns relating to the lack of buffers around riparian areas. Aerial application of pesticides and herbicides (as well as such chemicals as runoff), has the potential to severely impact salmonid stocks." NMFS expresses specific concern about "... the level of protection of Type N streams from exposure to herbicides or pesticides..." NMFS appears to cite a 1994 report on salmon in western Oregon and northern California, which indicates that the pesticides and fertilizers are applied at frequencies that indicate a potential for concern, and that fish are sensitive to some artificial chemicals (Botkin, 1994). In a 9/1/96 draft of the CZARA rationale, the adequacy of pesticide spray buffers for Type N streams appears for the first time and is carried forward until the final 1/19/98 determination.

EPA's January 1993 CZARA guidance describes its management measures for forestry (EPA-840-B-92-002, 1993) which includes the need to control forest chemicals. The guidance notes that herbicides, insecticides, and

fungicides (collectively termed pesticides) applied directly or aerially are most easily transported to surface waters and groundwater waters (Norris and Moore, 1971). Studies note that pesticides with high solubilities can be extremely harmful to aquatic organisms (Brown, 1974) and that they can sorb to particulates and bioaccumulate. As a result, the guidance calls for a forest chemical management measure where the State will

*“use chemicals when necessary for forest management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application: (4) Establish and identify buffer areas for surface waters. (This is especially important for aerial applications.)”*

The guidance states that the delivery of pesticides to surface waters from forestry varies depending on the type of application, presence or absence of buffers, and pesticide characteristics. Norris and Moore (1971) noted application of 2,4-D was 1-2 orders of magnitude higher in forestry operations without buffers than in areas with buffers. Fredriksen and others noted that in 8 years of monitoring Northwest forest streams, no herbicide residues were detected in water column 1 month after application. However, aquatic organisms and sediments were not sampled. Herbicide-induced changes in vegetation density and composition may cause indirect effects on streams such as increases in temperature or nutrients after riparian vegetation is eliminated. Fredriksen noted that unsprayed buffer strips should minimize these effects (Fredriksen et al., 1973). The guidance describes other studies that describe the benefits of buffers for aerial application of pesticides (Norris et al, 1991; Norris 1967).

#### *Factors to Consider:*

The main factors to consider in our action are as follows:

- 1) The 6217(g) guidance describes the need for spray buffers, especially for aerial application, for forest chemical management.
- 2) Oregon has neither riparian or spray buffers leaving Type N streams particularly vulnerable. Herbicides applied aerially on Type N streams can be transported downstream to fish-bearing streams or drinking water supplies, potentially impacting salmonids and other aquatic life (Botkin, 1993). Herbicides also have potential harmful secondary effects on salmon habitat by reducing near stream vegetation (Norris et al, 1991).
- 3) Type N streams comprise 60-70% of stream length in the Oregon coastal area. Coastal coho are listed as threatened under ESA, and there are many other salmonids in the coastal nonpoint management area.
- 4) We are likely disapproving the lack of riparian buffers on Type N streams under the riparian forestry management measure, and should consider if and how that overlaps with the determination for spray buffers. The remedy to address both riparian and spray buffers may be the same.
- 5) Oregon's program remains the same since we found deficiencies in the adequacy of Oregon's spray buffers for aerial application of herbicides on forests in 1998. We have reaffirmed this decision in 2001, 2004, and mostly recently in 2013.
- 6) Pesticides is a highly visible issue in Oregon. 35 of 85 comments we received related to comments on EPA and NOAA's pesticide determination. There are several ongoing investigations in the Oregon coastal nonpoint management area concerning human health exposure to aerial application of herbicides.
- 7) Neighboring states have some type of buffer protection for Type N streams during the aerial application of herbicides. Washington has both riparian and spray buffer protections. Washington's spray buffer for aerial application of herbicides is 50 feet (WAC-222-38-040). Idaho has riparian and spray buffers for non-fish bearing streams (Class II waters) of 100 feet (IAR 20-02-01). California has riparian buffers for non-fish bearing streams.

8) For buffers, the State relies on FIFRA labels to protect non-fish bearing streams for managing aerial application of herbicides on small non-fish bearing streams.

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10) Current court-ordered buffers apply to 3 herbicides and apply primarily to fish-bearing streams.

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13) Overall, ODA's inspection and enforcement program for FIFRA appears to be well-implemented by ODA. ODF and ODA have infrastructure in place to communicate with each other to track applicators. There is a gap in ODF notifications for ensuring that applicators follow FIFRA labels with regards to Type N streams.

14) There is a lack of monitoring to assess the effects of aerial application of herbicides on Type N streams for forestry uses. There are some studies on pesticides on fish-bearing streams, and supporters of disapproving and approving the program have cited the same studies.

15) Based on public comments, aerial application of herbicides on Type N streams may be occurring on forested areas. See attachment from Peter Leinenbach.

16) Comments from the State, public and organizations were conflicting and inconclusive. There were no studies or data on herbicides in non-fish bearing streams in the coastal nonpoint management area. The State did not offer new information on policies to protect Type N streams from aerial application of herbicides, though subsequent clarifications on ODA's and ODF's programs have helped us understand better how the State regulates aerial application of herbicides on Type N streams.

### Impact or significance of the issue

Type N streams compose 60-70% of the stream length in the coastal nonpoint management area. There are no required riparian buffers for forest harvests on Type N streams, and in some areas, trees can be harvested up to the stream banks. Since there are no spray buffers, herbicides applied aerially can be delivered directly into streams, which then eventually flow into fish-bearing streams where listed coastal coho and other fish species live and can be harmed.

Local citizens, environmental groups, state agencies, and industry will scrutinize our decision carefully because of ongoing concerns, investigations, or enforcement with public health exposure concerns from aerial drift of herbicides in several places in Oregon, including Triangle Lake. Also, there continues to be litigation in pesticides on labeling requirements and ESA species and a separate long-term multi-agency workgroup that is attempting to address those issues.

### Constraints

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### Who is impacted by the issue?

- Aquatic life and/or local landowners adjacent to areas where aerial application of herbicides occur

- EPA Pesticides Program and NMFS working on pesticide risk assessments and litigation

#### What are the risks of not resolving the issue?

We must take a final action by January 30, 2015 as agreed upon with NWEA.

#### Recommendations and Next Steps

- The options are to:

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There are two ways that the State could have an approvable program following CZARA guidelines, through having an enforceable program or a voluntary program with monitoring and tracking (Cite CZARA guidelines.)

**Enforceable program:** Oregon could institute statewide spray buffers for herbicides on Type N streams. ODA has authority to enforce FIFRA labels and has shown the willingness and ability to do this. Oregon could also institute riparian buffers on Type N streams, which by default would also require a buffer for herbicides. **OR**

**Voluntary Program with Monitoring and Tracking:** Instead of having statewide spray buffers in rule, the State could develop guidance and policies on voluntary buffers or on buffer protections for aerial application of herbicides on Type N streams. These could build on existing programs already in place with the addition of monitoring and tracking. Elements of the program could include the following:

- *Guidelines for voluntary buffers or buffer protections for aerial application of herbicides on Type N streams (new).*
- outreach by ODA to aerial applicators that focuses on minimizing aerial drift on Type N (non-fish bearing) streams and surrounding communities, including voluntary buffers; (state does this)
- *ODF notification to include a box indicating that aerial applicators must adhere to FIFRA labels for all stream types, including Type N streams; (new)*
- *monitoring the effectiveness of voluntary buffers on non-fish bearing streams in the coastal nonpoint management area for the aerial application of herbicides; (new)*
- *tracking outreach by ODA to aerial applicators of herbicides (state is working on this);*
- direct compliance monitoring by ODA of FIFRA labels for aerial applicators of herbicides in forestry; (state does this)
- *better mapping of N-type streams and other sensitive sites and structures; (unknown)*
- *better use of GIS and sensor technology to limit aerial application of herbicides on Type N streams; (unknown);*

Riparian buffers on Type N streams would likely significantly reduce the likelihood of aerial application of herbicides getting into Type N streams.

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